

MOZAMBIQUE

HUMAN CAPACITY BUILDING ASSESSMENT

AGRICULTURE SECTOR

A Joint USAID and BIFAD Assessment

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Team members:

Ann Skelton, *Team Leader*
Peter Fraser
Marcos Freire, PhD, UEM
Anthony G. Laos, BIFAD

Submitted by:

Development Associates, Inc.
1730 North Lynn Street
Arlington, VA 22209-2023

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GLOSSARY OF ABBREVIATIONS

BIFAD	Board for International Food and Agriculture Development
CLUSA	Cooperative League of USA
DINER	Direccao Nacional de Extensao Rural
EARTH	Escuela Agrícola de la Región Tropical Húmeda
EGAT	Education Economic Growth Agriculture & Trade (Office Of USAID)
EMBRAPA	Empresa Brasileira de Resquesa Agropecuaria
FAO	Food and Agriculture Organization
FRELIMO	Frente de Libertação de Mozambique
GAPT	Sociedade de Promoção de Pequenos Investimetos
GRM	Government of Republic of Mozambique
IEHA	[Presidential] Initiative to End Hunger in Africa
IFI	Intermediary Financial Institution
IAC	Instituto Agrario de Chimoio
IIAM	Mozambique Institute for Agricultural Research
ISTEM	Higher Institute of Science and Technology of Mozambique
ISPU	Higher Polytechnic and University Institute
IR	Intermediate Result
MADER	Ministerio de Agricultura e Desenvolvimento Rural
MESCT	Ministry of Higher Education, Science & Technology
NGO	Non governmental organization
PARPA	Plano de Accao para a Reducto de Pobreza Absoluta
PROAGRI	Programa Nacional Agarario
PVO	Private Voluntary Organization
RENAMO	Resistencia Nacional Mocambicana
RSA	Republic of South Africa
SO	Strategic Objective
START	Strategic Technical Assistance for Results with Training
UCM	Catholic University
UEM	Universidade Eduardo Mondane
USAID	US Agency for International Development

EXECUTIVE SUMMARY

Mozambique, a country of 800,000 square kilometers has an estimated population of just over 17 million largely agrarian inhabitants. Though desperately poor, it remains a focus of the international donor community who supports the efforts of a nascent democracy attempting to reorient its systems and institutions toward the free market after years of socialism and civil war. Its geographic location in the southeastern corner of Africa combined with its history and potential for continued economic growth make it a focus country in the President's Initiative to End Hunger in Africa (IEHA). USAID's own strategic plan identifies activities to promote advances in the agriculture sector.

This report covers the work of a joint USAID and BIFAD team convened to conduct an agriculture sector human capacity assessment consistent with USAID/Mozambique's Strategic Objective 6, *Rapid Rural Income Growth Sustained in Target Areas*. BIFAD, recognizing a "human resource crisis" in agriculture, supports the development of agriculture and agribusiness educational activities in conjunction with USAID and with African stakeholders. Based on the development needs within the sector the joint team is charged with setting forth specific recommendations and options for training interventions that will be consistent with the Mission's strategic plans and which involves stakeholders in the decision process.

Findings were based on extensive interviews and meetings with stakeholders from the public and private sectors in agriculture, visits to institutions, agribusinesses meetings with stakeholder groups, and information from numerous recent reports. The following report provides a discussion of the major constraints found in the agriculture (rural) sector, suggestions as to probable causes of the problems and, finally, recommendations for a long-term capacity building program involving technical and academic interventions.

Particular areas where constraints can be addressed are found in both the private sector and public sector. The following issues provided the basis for capacity building recommendations.

1. Vocational/technical areas important to farming and agribusiness

The agriculture sector as a whole is characterized by lack of basic skills in areas important to farming: machinery maintenance, motor mechanics, metal work, basic electronics. As described by the representative of regional director of agriculture in Manica the lack of 'know-how' in the Mozambican farmer prevents his ability to grow and improve.

2. Lack of trained technical extension specialists serving rural populations

The extension system is small, between 600 and 700 persons, the majority of whom have a low technical education level. The government recognizes the many constraints to an effective service and, as a partial solution, has begun to outsource extension services to some NGOs in rural areas. Nevertheless, extension remains an area where capacity building activities especially through short-term knowledge building and methods courses, could make a significant difference.

3. Lack of basic business and management skills across the workforce

A common refrain echoed by business leaders and donors alike was the need for the most basic business skills at all levels. Representatives from the business roundtable emphasized the need for extensive and basic business skills from the technical, i.e., ‘grower level’ to the small and mid enterprise level. “Businesses need employees who know how to do things” from manual work to decision-making. Basic numeracy and literacy, simple bookkeeping, carpentry and mechanics as well as orientation to running a business were all cited as needed to improve private sector performance. Very clearly stated was the absence of practical workplace skills among recently graduated employees, even those from the technical agricultural schools. Related to the constraints on business from an unskilled workforce was the lack of confidence and trust that employers place in their workers.

Entrepreneurship

The absence of an entrepreneurial tradition due to the colonialist and socialist past is frequently cited as an explanation for the weak private sector in Mozambique. Educated people have generally been groomed in professional areas and are not oriented to the notion that business ownership or self-employment is a real and viable option. The uneducated or poorly educated population that represent the vast majority of Mozambicans have little exposure to a model of successful business ownership and thus do not aspire to ownership and, even less, entrepreneurship. The idea that surfaced repeatedly in interviews was that of incorporating into the educational system courses in business development. The idea has wide currency in Mozambique and should be explored further.

4. Limited access to credit for small enterprises in rural areas

Credit is acknowledged to be in short supply and costly. Interest rates reach above 30% with no special provisions for rural or agricultural endeavors. Overall, the process of strengthening access to credit through rural institutions is a larger issue than capacity development alone. Developing an approach to improving access to credit was beyond the scope of the assessment team; however, associations and forums organized by CLUSA have provided training and continue to review credit requests for GAPI. Basic knowledge and experience with credit, loan analysis, general business and management skills are needed at the enterprise level. Loan recipients need training in the basics: calculating interest, obligation to repay loans, fiscal responsibility as well as growth oriented, commercial business precepts. Associations as well as schools can be the conduit for training people to start businesses, provide quality service, understand the obligation to repay loans and basically develop the approach that will make them a sound risk for creditors.

5. Limited number of university trained staff capable of structuring and carrying out research in specific relevant areas

The needs of the government Agricultural Research Institute (INIA) can be summarized under two headings: the need for an increase in the numbers of trained scientists and technicians followed by the need to direct the research focus to areas not currently covered.

A frequently expressed concern related to agricultural research is the insufficient number of scientists who can formulate and carry out agricultural research relevant to Mozambican needs. Excluding support staff there are fewer than 500 professional level employees in the research system. Just over 100 have degrees. Very few have graduate level training adequate to formulate and supervise research studies. Technicians who carry out the experiments also need training and skills upgrade. Though some technicians have BSc degrees, most have the equivalent of a secondary school education. Focusing on the research staff the goal of the Ministry is to upgrade each level. Thus technicians at Nivel Medio should have BSc degrees, the BSc should receive MSc and so on. The team recommendation will focus on the Masters level augmented by short, topic-specific courses.

6. Training extension workers is also a priority for increasing smallholder productivity

As presently organized the extension service under the Ministry of Agriculture and Rural Development (MADER) is a new organization beset with staffing problems. It was started in 1988 and presently has approximately 600 extension workers, most with low academic and professional training. (As a point of reference Tanzania has 5,000 and Zimbabwe 8,000 extensionists.) An important institutional problem faced by most agencies within MADER is that as specialists become trained, be they scientists or technicians, they are quickly hired away by one of the NGOs who offer better salary and equipment. Though they recognize the need for better trained extension workers as mentioned above under the private sector discussion, there is no motivation for getting an additional qualification. Neither salary nor status within the Ministry changes. Notwithstanding the internal issues that must be resolved by the Ministry, there is a clear case for providing training for extension agents.

As the agricultural programs are probable conduits, the team reviewed agricultural education at various levels as to how existing programs supported the rural farmer and how agribusiness skills were promoted. At the technical school level we visited agricultural schools in Choimoio in Manica Province and Boane in Gaza province (Nivel Medio). Though graduates work as extension agents as well as in the private sector, we were unable to find strengths in the agricultural education programs directed toward agribusiness and entrepreneurship. The team also held discussions with professors from UEM with a view to constructing twinning programs with U.S. institutions.

Future Agricultural Education Program: Under the Ministry of Higher Education, Science and Technology (MSCAT) a completely new system of polytechnical education similar to the South African Technikon is projected to open in 2005. These are to offer a three year course of study beyond the secondary level, thus Educacion Superior. The technikons will offer a three year program answering the need for a practical curriculum that will respond to the business community, encourage self-employment, and act as incubators to new businesses. Students will enter after completing grade 12. Because these schools are to be located outside of Maputo (one in Boane and one in Chimoio) they will serve both the provincial student population and serve the surrounding business community as a resource. This is an area where USAID may be able to offer effective support in the future.

Recommendations to Address Constraints to Private Sector Growth: vocational skills and basic business skills

The assessment team identified a number of basic issues that should govern the training approach in any plan adopted for Mozambique.

- The preponderance of training should take place in Mozambique or in the region;
- Initial training should be designed as short-term, intensive workshops focused on near-term needs;
- Short-term research programs focused on special topics are a priority;
- To the extent possible all capacity building should have a practical component;
- Programs in Brazilian agricultural universities should be identified to minimize language barriers;
- Appropriate agricultural programs in South African universities, e.g., The University of Natal, should be identified;
- Graduate level training should be offered through new Academic Institutes; and
- Twinning programs with international universities can be established thus requiring minimal time outside the country.

MOZAMBIQUE

HUMAN CAPACITY BUILDING ASSESSMENT

AGRICULTURE SECTOR

PART I: INTRODUCTION

A. BACKGROUND

USAID/Mozambique is ready to embark on a new country strategy for the seven-year period from 2004 through 2010. The strategy for the agricultural sector, Strategic Objective 6, *Rapid Rural Income Growth in Target Areas*, sets out USAID's development focus in Mozambique and identifies capacity building and skills transfer as central to rural income growth. Among the international donors USAID takes a lead role in supporting the private sector as the key to increased rural incomes. It has also determined to provide assistance to the public sector in agriculture primarily through extension services and research. Capacity building to improve performance in the public and private sectors is critical to USAID achieving its development goals.

Two other Washington-based programs relate to USAID/Mozambique's endeavors. The new Strategy is closely aligned with the Presidential Initiative to End Hunger in Africa (IEHA), which identifies Mozambique as a focus area. Additionally, the Board for International Food and Agriculture Development (BIFAD) launched an initiative to increase the number of regional and U.S. based capacity-building programs at the graduate level as well as undergraduate and short term training levels. Mozambique is one of three focus countries of BIFAD's scholarship promotion.

This report covers the work of a joint USAID-BIFAD team convened to conduct a broad-based human capacity assessment within Mozambique's agriculture sector. The four person team brought combined expertise in agriculture, agribusiness, rural development and training design/performance improvement. An experienced agribusiness representative from BIFAD together with a rural development specialist and a training specialist from Development Associates were joined by a Mozambican agronomist to conduct the assessment.

B. MOZAMBIQUE: HISTORY AND POTENTIAL

History

No capacity building assessment for Mozambique can be undertaken without considering the legacy of Mozambique's recent history. For almost five hundred years, until 1975, Mozambique was a Portuguese colony. Independence saw a rapid exodus of Portuguese settlers including most of the professionals in the country, and the Frente de Libertação de Moçambique, FRELIMO, took over the government of the new country. Being of a Marxist orientation, FRELIMO installed a socialist, centrally-planned economic regime. Because Mozambique was so deprived of infrastructure, communications, and human capital after independence, the socialist experiment was doomed from the beginning. Exacerbating the problems of the nascent

socialist government, an opposition movement, RENAMO, supported by (then) Rhodesia and South Africa, began an armed insurgency. A brutal civil war with widespread destruction of life and infrastructure continued until peace accords were signed in 1992.¹

The combined colonialist and Marxist histories of Mozambique has left the country devoid of a well defined commercial and market orientation, with a noticeable lack of business acumen and management skills throughout the workforce and little evidence of local entrepreneurial skills. Today we see evidence of a very small business class who are primarily located in Maputo and its environs and whose economic sphere of influence is more directly related to South Africa and other parts of the Southern Africa Region than to the very poor areas in the center and northern provinces of the country. The public sector also manifests classic characteristics of the socialist and paternalist traditions of government: lack of merit-based reward, poor compensation by any standards, oversized government workforce, mainly reactive/obedient employees, with little incentive to innovate. The lack of an incentive structure in the salary and benefits of public sector employees contributes to the unfortunate concentration of higher level personnel in the capital city, a problem recognized by Ministry officials as contributing to the lack of experienced staff in the more remote (agricultural) centers.

During the fourteen-year era of Marxist rule, many university academics, government officials, teachers, and technicians in science and the vocational/technical fields were trained in satellites of the ex-Soviet Union, Eastern Europe, and Cuba. These people are now at mid-career in positions of leadership in public administration and educational institutions setting policy and the academic agendas of their organizations. Many of the public sector officials interviewed, specifically in the Ministry and its subordinate agencies, recognized the limits of their socialist formation and desired a change to market-oriented values. Nevertheless, the habit of waiting for orders and reluctance to make decisions characteristic of the top-down mentality in dysfunctional bureaucracies can still be seen. This capacity development report provides practical recommendations to achieve the more market oriented approach desired by the progressive GRM officials.

Potential for Development

Viewing the Mozambican agricultural landscape we see a country advantaged by climate, soil and government determination that seems poised on the brink of prosperity but remains desperately poor. The population lives in extreme poverty, most of it in isolated rural areas with no, or very limited, access to roads, public transportation, health services and schools. The majority of the population lives on less than US\$2 per day. The effect of the poverty is reflected in the health of the population: more than half (54.7%) of the population is undernourished; infant mortality is 129.3 per thousand live births ²; 40% of the general population is illiterate, although approximately 71 % of females over age 15 are illiterate.

Stark socioeconomic indicators are countered by other agricultural details in Mozambique that combine a picture of untapped resources and a positive political will – the qualities to make the country grow and thrive. An average growth rate in the GDP of 7% between 1991 and 2000 (according to the World Bank Country Indicators) combined with political calm, Government

¹ Development Associates. Mozambique Assessment Report. Dennison and Monnerat. September, 2002.

² World Bank Country Indicators, 2000.

commitment to market reform, abundance of arable land, as well as the variety of cash and food crops present an optimistic picture of continued and future development. The potential for sustained agricultural growth is supported by both general economic and sector indicators combined with related active programs.

Initiative to End Hunger in Africa (IEHA)

Recognizing the potential for growth and regional leadership President Bush announced a US development role for Africa that focuses on several strategic countries including Mozambique. Three principles guide the US position:

- First, that failure to help now is not an option;
- Next, that partnership with the people and government of Mozambique is a formula for a southern African model of success; and
- That developing human capacity is the best insurance for future growth.

Driven by the urgency of need and the recognition that hunger in Africa is one of the most significant development challenges facing the world today, the President's initiative was launched. The IEHA Action Plan puts the principles into practical terms.

The six IEHA themes to be emphasized over the next years are:

- ☐ scientific and technological applications;
- ☐ efficient trade and market systems;
- ☐ community- and producer-based organizations;
- ☐ developing human capital, infrastructure and institutions;
- ☐ integrating vulnerable groups; and finally
- ☐ management of the environment.

USAID/Mozambique's Agricultural Priorities

These same themes of the IEHA framework are reflected in USAID/Mozambique's program. Currently USAID/Mozambique has planned programs that directly support IEHA. SO6, Increased Rural Incomes, focuses on improving smallholder agriculture incomes and output through increased research and extension combined with increased sales to market.

C. ASSESSMENT METHODOLOGY/APPROACH

In response to the request from USAID's Office of Economic Growth, Agriculture and Trade Bureau (EGAT), the assessment team traveled to Mozambique between August 15 and September 4 to develop a capacity building plan and set forth specific recommendations for training interventions consistent with Mission strategic objectives. The purpose of the assessment was to identify long and short-term capacity building interventions that will contribute to the development needs within the agriculture sector. The complete Terms of Reference for the assessment are attached in Appendix A.

Preparation for the interviews and focus group meetings included meetings with USAID SO 6 team members, identifying key informants in the agriculture, government education and financial sectors, setting schedules for the roundtables and focus groups. The team also reviewed numerous sectoral studies and background reports completed over the past year which supported USAID's initiative in the agriculture sector. A list of reports is included in Appendix B.

Stakeholder Involvement

It is well-known that assistance, no matter how well conceived, cannot be successful in the long-term without stakeholder buy-in. Recognizing this fundamental concept the team involved stakeholders in the data gathering and decision-making process. The team interviewed well over 30 government and private sector representatives both in Maputo and four areas outside the capital: Beira in Sofala Province, Chimoio in Manica Province, Nampula, the capital of Nampula Province, and Boane in Gaza. The team interviewed key personnel from the public sector, chiefly from the Ministry of Agriculture and Rural Development (MADER), educators from the Ministries, public and private universities, technical schools, international institutions and NGOs, financial lenders and agribusiness leaders. In order to gather as much data as possible we held both group discussions and individual interviews. A roundtable discussion of business leaders, separate focus groups of agriculture professors as well as returned scholarship recipients provided extensive information and insights. It was also our good fortune to attend a public hearing in which plans for the forthcoming polytechnics, two devoted to agriculture, were presented for comment.

In each interview we elicited suggestions for improving the levels of education of existing faculty and identifying current constraints to improving quality of education as well as alternative training solutions. We augmented our initial findings with telephone interviews and web research on selected international agriculture programs. See Appendix C for a list of persons contacted.

Preliminary findings were reviewed with the USAID SO6 Team periodically throughout the visit. The following report identifies major constraints found in the agriculture (rural) sector, discusses probable causes of the performance problems and identifies the discrepancies that lend themselves to a human capacity/training response. Recommendations for a long-term capacity building program involving technical and academic interventions are presented in Part III and IV.

As an organizing principle, the information and analysis is divided into private sector interests followed by public sector. However, the recommendations for capacity building found in Section III are discussed in order of importance and greatest impact.

PART II: NEEDS ASSESSMENT FINDINGS

A. PRIVATE SECTOR/SMALLHOLDER PRODUCERS

USAID/Mozambique's Strategic Objective 6 - *Rapid Rural Income Growth Sustained in Target Areas* focuses attention on smallholder farm productivity as well as on private sector rural enterprises and agribusiness as engines of economic vitality. The output and productivity of the smallholder farm must be improved in order to make a difference in rural incomes. With 80% of the population of Mozambique dependent on agriculture for a living, improving the prospects for emerging commercial agriculture must include increasing the production and marketing capability of the smallholder, expanding the coverage of rural financial services, and enhancing the capacity to move products from the farm to markets.

Rural income growth also depends on the development of small rural inputs, market outlets and other service enterprises as well as an increase in medium and large scale agribusinesses. The skilled people to start these enterprises and manage them successfully are part of the very population group in short supply throughout the rural economy of Mozambique.

We noted, for example, that in spite of the fertile soil and potential for large harvests in the mid and northern regions, vegetables are still imported in large quantities from South Africa. High transportation costs and delays from internal bureaucracy make the importation of horticulture from South Africa comparatively economical. The poor condition of the farm to market road system contributes to this anomaly.

The private sector has a pivotal role in increasing rural incomes both at the smallholder farmer and rural enterprise levels. As well as employment a thriving agribusiness sector would support and promote improved farm productivity. Thus, it becomes important to identify the constraints associated with the weak Mozambican agribusiness sector and to promote the commercial sector of agriculture.

Another fundamental issue that remained a constant undercurrent is the low literacy rate in the country which increases among women and in rural areas. Older Mozambicans who have not completed a full cycle of basic education (grades 1 through 5) may not speak Portuguese and thus may not be able to participate fully in services and understand information provided by NGOs and government extension workers. According to the World Bank Country Indicators for year 2000, 40% of the general population is illiterate; this rises to 70% among rural females.

The following section details the current situation organized under the greatest and most common constraints to growth.

1. *Lack of skills in the vocational/technical areas important to farming*

Though agriculture is the predominant economic activity in Mozambique, the typical smallholder farm in Mozambique is less than five hectares.³ Typically, cultivation is manual; yields are low yet diversified having both crops and small animals. A portrait of the smallholder highlights a lack of information and expertise relative to production methods, information on the importance

³ Kyle et al. Opportunities and Constraints in the Smallholder Sector. p.1.

of crop rotation, market demands, use of nutrients, dietary needs and health of animals. Beyond the family farm itself, the agriculture sector as a whole is characterized by lack of basic skills in areas important to farming: machinery maintenance, motor mechanics, metal work, basic electronics. As described by the representative of regional director of agriculture in Manica the lack of ‘know-how’ in the Mozambican farmer limits his ability to grow and improve. A comparison with the Zimbabwean farmers who enter the market in Choimoio, set up shop, rent equipment, hire laborers and produce marketable crops, all in short order, completed a picture of the lack of capacity or ‘know-how’ in the Mozambican small farmer.

2. *Need for sound technical extension specialists with understanding of the entire production chain*

The logical response to such specific need for information and technical assistance on the part of the farmer is to provide direct technical assistance through extension workers. The main body of extension workers is part of MADER, though extension services are frequently provided by various NGO groups working in the rural areas. The extension service under MADER faces a number of obstacles to effective coverage of the rural areas. First the extension system is small, between 600 and 700 persons, the majority of whom have a low technical education level. Most extension workers come from the agricultural technical schools which, while they may provide sound basic instruction, offer very little practical experience. Working and living conditions for extensionists are not structured to induce them to relocate from Maputo to rural and isolated areas; they are not provided with transportation to visit farms; and they are frequently hired away from government employ by better paying NGO organizations. The government recognizes the many constraints to effective service and, as a partial solution, has begun to outsource extension services to some NGOs in rural areas. Nevertheless, extension remains an area where capacity building activities, especially as short-term knowledge building and methods courses, could make a significant difference.

3. *Lack of basic business and management skills across the workforce*

A common refrain echoed by business leaders and donors alike was the need for the most basic business skills at all levels. Representatives from the business roundtable emphasized the need for extensive and basic business skills from the technical, i.e., ‘grower level’ to the small and mid enterprise level. “Businesses need employees who know how to do things” from manual work to decision-making. Basic numeracy and literacy, simple bookkeeping, carpentry, and mechanics as well as orientation to running a business were all cited as needed to improve private sector performance. Very clearly stated was the absence of practical workplace skills among recently graduated employees, even those from the technical agricultural schools. Related to the constraints on business from an unskilled workforce was the lack of confidence and trust that employers place in their workers. This issue of trustworthiness apparently refers to instances of thievery as well as simple workplace responsibility.

These generalized but common observations led to suggestions for practical training models like internships or larger scale industry-led training. The concept of internships has appeal in that it provides the possibility of transmitting highly focused workplace skills as well as elements of positive workplace behaviors like punctuality and a positive business ethic. The challenge, however, is to construct internships with real learning experiences and to find enough placements for many interns. Workplace learning for significant numbers of students demands a large-scale

operation (like the fruit growers CENTRUM or Vilvar Roses in Manica) or a larger number of business placements than is typical of the agribusiness sector in the northern provinces. An interesting South African model is one in which the government provides financial incentives to companies to encourage employers to scale up internships (called learnerships in RSA). Employers are encouraged to take on more interns than they need for their own operations through a system of financial bonuses. A cross border dialogue to see how such internships are designed, managed and funded would be useful in a final capacity development plan.

Entrepreneurship

The absence of an entrepreneurial tradition due to the colonialist and socialist past is frequently cited as an explanation for the weak private sector in Mozambique. Educated people have generally been groomed in professional areas and are not oriented to the notion that business ownership or self-employment is a real and viable option. The uneducated or poorly educated population that represents the vast majority of Mozambicans has little exposure to a model of successful business ownership and thus does not aspire to ownership and, even less, to entrepreneurship. The idea that surfaced repeatedly in interviews was that of incorporating into the educational system courses in business development. The idea has wide currency in Mozambique and should be explored further.

Though many aspects of entrepreneurship and self-employment cannot be inculcated through a course, there are aspects of ownership that can be incorporated into curricula. These include topics on business management, administration, marketing, returns on investment, decision-making, planning for the future, risk taking, how to develop an enterprise and many others. Part III of this report discusses such courses and programmed relationships with businesses that could provide internships at the secondary and undergraduate university levels of education.

4. *Limited access to credit for small enterprises in rural areas*

Though much can be said regarding the limited access to credit and the need for expanding and easing credit costs for the emerging enterprise, the restructuring or even significant intervention in the rural credit system is beyond the scope of this assessment task. Nevertheless, the team recognizes the important relationship between access to credit and the growth of the agribusiness sector. GAPI, *Sociedade de Promoção de Pequenos Investimentos*, is a Mozambican company that promotes national entrepreneurship and works extensively in rural credit, including in the northern region of Nampula, one of USAID's high focus areas. They recognize the complexities of rural credit due to high interest, high processing costs and poor access. Though the company mission is to provide credit, they recognize as more important the need to teach the basics of business. The expansion of Intermediary Financial Institutions (IFIs) requires business development services for clients and intermediaries. Basic knowledge and experience with credit, loan analysis, and general business and management skills are needed at the enterprise level. Loan recipients need training in the basics: calculating interest, obligation to repay loans, fiscal responsibility, and growth-oriented, commercial business precepts. Small enterprise owners need to improve quality of service. Associations and schools can be the conduit for training programs and orientation in preparing people to start businesses, provide quality service, understand the obligation to repay loans and basically develop the approach that will make them a sound risk for creditors. According to one respondent, the right approach to creating entrepreneurship is to "strengthen companies [not create schools] and the companies will train."

A first-line training response is to focus on the potential beneficiaries of credit. Training would cover credit management and the importance of timely repayment of loans. Seminars and roundtables relating to credit issues could be provided through the farmer associations or NGOs like CLUSA. Training options are discussed in Part III.

B. THE PUBLIC SECTOR: RESEARCH, EXTENSION AND EDUCATION

MADER is one of USAID's principal institutional counterparts in channeling SO6 activities. The Government of Mozambique's agricultural policy for poverty reduction is closely aligned with USAID's objective of *Rapid Rural Income Growth Sustained*. Agricultural activities supported by the principal donors have been coordinated through a Ministry plan called PROAGI. Considered a success in preventing duplication of effort and organizing the principal donor group efforts, the second five year period of PROAGRI coordination is to begin in 2004. Beyond its central management functions MADER supports rural agriculture through two directorates: Extension Services and Research.

The structure and human resources of MADER itself require some attention as they affect operations throughout the agricultural sector. An institutional assessment of MADER, recently undertaken with the support of the Food and Agricultural Organization (FAO), has identified the numbers of employees, their distribution and responsibilities throughout Mozambique, the organizational constraints and recommendations for capacity building. The data and recommendations of the FAO assessment were useful to our team in understanding the structure of MADER as well as seeing the priority training recommendations.⁴

As part of the institutional reform MADER plans to reduce the current 6,600 person staff first through obligatory retirements for those with 35 or more years of employment and or 65 years of age, followed by voluntary early retirements based on a series of characteristics. Many of these older and long-time employees also have a low level of education, Nivel Medio or less. Before staff levels can be reduced a number of institutional and governmental programs, e.g., a pension system, must be in place. However, once changes are made MADER plans to attempt to move many staff to regional assignments and strengthen services by hiring better prepared and better educated staff. Constraints to optimal performance in the central ministry and the directorates are discussed below.

1. Management skills for MADER directors and chiefs of departments

Training appears to be needed in many departments and in technical skill areas, e.g., land use, land reform, cartography, land mapping. Management skills are reported to be woefully lacking at all levels. Thus, focus areas for training interventions include decision making, team building, organizational and communication skills, and human resource approaches. Management training for key officials in MADER is to be designed by a training consultant who is currently working with the human resources department. The courses that he designs on management skills for MADER directors could prove to be a convenient and cost efficient way for USAID to support management improvement at the Ministry.

⁴ Anexo E. Programa de Recursos Humanos para o Ministerio da Agricultura e Desenvolvimento Rural. (Versao 2), Novembro de 2002.

MADER has yet to resolve a number of institutional issues that will affect the success or failure of this phase of the reorganization. First, the planned retirement and pension scheme needs to be put in place in order to reduce the number of redundant workers. After the retirement plan is initiated an incentive system must be established that will induce scientists and technicians to live in rural provinces with few amenities and uncertain electricity service. Finally, strategies are needed to improve the sharing of data and information among researchers, extensionists and smallholders. Frustration with the failures of communication among the various parties (INIA and extension services, MADER and the NGO conducting research) was evident in many interviews. This is discussed as a constraint under #3.

Within MADER the two key divisions important to the objective of improving rural incomes are the extension service and the National Agricultural Research Institute (INIA). INIA, about to be reinvigorated as a single entity IIAM, (see below) is responsible for agricultural research carried out in Mozambique through a network of research stations in the provinces. Both of these divisions need trained personnel at various levels.

2. Lack of university-trained staff capable of structuring and carrying out research in relevant areas

The need for upgrading the skills and the professional levels of the research personnel was emphasized at every interview. Additionally, a review of the numbers of trained researchers argues for placing capacity building resources here. However new programs for researchers should be coordinated with recent or existing activities targeting this group.

Restructuring the Research Organization into Zonal Centers, IIAM

Internal changes in the structure and organization of the research divisions are imminent. At present four separate research institutions under MADER with the same objective carry out separate research mandates. These are to be combined into a single organization, designated as the Mozambican Institute for Agricultural Research (IIAM). The new entity will carry out its activities through four agro-ecological Zonal Research Centers focused directly on the agricultural needs of the region. The research agendas will be decided in the regions in order to meet local community needs. The Zonal Centers have been identified as

- Northeast: centered in Napula but including Cabo Delgado, parts of Zambezia and Niassa;
- Northwest: centered in Lichinga, Niassa Province but including Tete and the highlands;
- Central: Sussendenga in Manica including parts of Tete, Sofala and Zambezia; and
- Southern Zone: centered in Chokwe and covering Gaza, Inhambane and Maputo.

Related information about the policy, organizational structure, and the staffing of both the research function and the extension services has been described in Gaps and Opportunities for Agricultural Sector Development in Mozambique. Bias & Donovan. April 2003.

Under-prepared researchers

The needs of the Agricultural Research Institute can be summarized under two headings: the need for an increase in the numbers of trained scientists and technicians followed by the need to direct the research focus to areas not currently covered.

The overriding concern related to agricultural research is the insufficient number of scientists who can formulate and carry out agricultural research relevant to Mozambican needs. Excluding support staff, there are fewer than 500 professional-level employees in the research system of which just over 100 have degrees. Very few have graduate-level training adequate to formulate and supervise research studies. Technicians who carry out the experiments also need training and skills upgrade. Though some technicians have BSc degrees most have the equivalent of the U.S. secondary school education (Nivel Medio or technical school in Mozambique).

Several institutional issues other than training and education need to be addressed before any change can occur. First, as is the case in all major divisions of the Ministry, most of the scientists are located in Maputo rather than the rural, agricultural provinces. For the new Zonal Center concept to work the proportion of scientists assigned to the provinces must increase. MADER planners already recognize that a satisfactory incentive system to attract employees to the remote areas must be put in place. MADER, and indeed most GRM and some NGOs, struggle with the frustration of rapid turnover of trained personnel. Once an individual has received specialized training s/he becomes very attractive to the competing donor and NGO community which generally offers better salaries (though not necessarily better benefits) than GRM or the educational community.

3. *Extension Service: constraints to effective outreach to farmers*

- **high turnover of personnel;**
- **insufficient numbers of knowledgeable, trained extension workers; and**
- **no formal mechanism to share ongoing research results among parties.**

The extension service under MADER is a comparatively new organization beset with staffing problems. It was started in 1988 and presently has approximately 600 extension workers most with low academic and professional training. (As a point of reference Tanzania has 5,000 and Zimbabwe 8,000 in their extension services.) The current system is organized in networks, each of which has several teams comprised of technicians, their supervisors and subject matter specialists. Each network covers up to three districts. Subject matter specialists in agriculture receive training in technical areas and then impart that to the technicians who in turn work with up to 15 groups of farmers. The current plan also designated technicians to assist with field trials and promote local self-help activities. Of the 128 districts in Mozambique, 55 are covered by the extension network.⁵

Turnover. An important institutional problem faced by most agencies within MADER is that as specialists become trained, be they scientists or technicians, they are quickly hired away by one of the NGOs offering better salary and equipment. Though they recognize the need for better trained extension workers as mentioned above under the private sector discussion, there is no

⁵ Bias and Donovan. Pp 84 & 85

motivation for getting an additional qualification. Neither salary nor an employee's status within the Ministry changes with additional coursework or degrees. Further reducing any sense of loyalty to the Ministry is the issue that most extension workers are contract employees who have no job security and fewer benefits. For example, as contract employees they do not have education benefits as do their Ministry counterparts.

Lack of funding for training was cited by directors and program managers as a major cause of continuing problems. A sum of \$1.7 million was recently cut from an identified \$4 million for training. Likewise the overall budget of MADER was considered inadequate with only 11% of the MADER budget spent on extension.

Under-prepared agents. If we accept the reasonable conclusion that smallholder yields and incomes will improve with better information and techniques then the importance of a strong and effective extension service is a *sine qua non*. Well-prepared extension workers both from private sector (outsourced service) and from MADER would have to be trained in the entire production chain: soil – seed – inputs (nutrients) – crop selection – market. The current educational level of the MADER extensionist is very low, sometimes as low as basic level (assumed to be roughly equivalent to grade 8).

In addition to an overall need for improved educational level among extensionists, expertise is needed in myriad special topics: soil fertility and conservation, plant breeding, specific commodity crops (sunflower, sorghum, pulses) and poultry diseases. Techniques are needed to help farmers to establish prices and to balance their planting between cash crops and food crops. In fact, basic communication techniques are needed for dealing with farmers who themselves have low literacy and undeveloped technical farming skills.

Information Exchange. A significant problem is that of transferring information, generated by research and through demonstration plots, to the field level extension services. Because of lack of communication channels between research labs of INIA and extension and between NGOs and MADER, the results learned are sometimes written into reports but in a form not easily accessed by those who need the information. Frustration with the lack of sharing existing information was evident from several sources though no solutions were proposed.

Discussion of the training needs of extension technicians opens additional questions about needs within agricultural education.

4. *Lack of agribusiness focus at all levels of agricultural education*

The team reviewed agricultural education at various levels in Mozambique with a view to assessing specific issues: a) how existing educational programs support the rural farmer; b) what the institutions prepare their graduates to do; c) the emphasis placed on agribusiness in the curriculum; and d) how existing institutions might partner as a training provider in agribusiness courses. At the university level various team members visited and interviewed professors at Eduardo Mondlane University, Catholic University in Beira, the Pedagogic University and the Higher Institute of Science and Technology of Mozambique (ISTEM). At the technical school level we visited agricultural schools in Choimoio in Manica Province and Boane in Gaza province (Nivel Medio). Our expectation was that the technical schools would be the closest direct link to the small farmer as well as to the small town agribusiness sector. Though this

proved not to be the case, (there was no program or dialogue between the secondary schools and farmers) the agricultural technical schools could be the venue for teaching specialized courses in agribusiness and extension services.

Mozambican Educational System

Primary Level: through 7th grade

- ☐ First cycle is compulsory: grades 1 – 5
 - ☐ Second cycle, not compulsory: grades 6 – 7
- [Requirement that 20% of the curriculum have 'local' content. Thus, basic agricultural topics should be included in the primary curriculum of rural schools. Most teachers are not knowledgeable enough to handle this.]

Secondary Level (also called Medio)

- ☐ First cycle: grades 8 – 10. After this students can choose an agriculture school like IAC
- ☐ Second cycle: grades 11 – 12. Pre-university

University Level

- ☐ Eduardo Mondlane University (UEM) established 1962
- ☐ Pedagogic University (UP)
- ☐ Catholic University of Mozambique, 1995
- ☐ Mussa Bin Bik University, 1998
- ☐ Higher Polytechnic and University Institute (ISPU), 1995
- ☐ Higher Institute of Science and Technology of Mozambique, 1996

Agricultural institutions in the public sector fall under two different ministries: the mid level technical (agricultural) schools are under the control of the Ministry of Education. Admission to the technical, i.e., secondary schools can be granted after completion of grade 10 by passing an exam. Those students have 3½-year program of studies. More common however is to enter the technical school after grade 12 and complete a two-year program. As reported in the Wingert report on Agricultural Education in Mozambique, the students graduate with a certificate and no university credits.

Graduates from the technical agricultural schools work primarily as extensionists, go into the private sector or go into an administrative position at MADER in Maputo. A frequently repeated criticism of the educational system is that students are prepared to be employees, not to initiate activities. It is important to note that most of these graduates have scant experience in the occupation of farming. Most do not come from a farm background and, despite participation in internships, practical experience during their course work has been cited as a decided gap. According to the staff interviewed, most graduates from Boane (roughly 60%) work for the private sector; from IAC they go to extension or MADER. Very few graduates from either institution go directly into farming.

University-level agricultural education at Eduardo Mondlane University and the planned Polytechnics (projected to open in 2005) falls under the structure of the Ministry of Higher Education, Science and Technology (MSCAT). Higher education programs in agriculture (Educação Superior) have been initiated at Universidade Catolica of Mozambique (UCM), the Cuamba campus; also, a new Master of Science in Agronomy has been started at the *Universidade Eduardo Mondlane* in Maputo. The location of the program in Maputo presents a

constraint in terms of the USAID objective of increasing rural incomes as most of the graduates prefer to stay in the city rather than relocate after years of study to the rural areas. Most graduates are employed by the government. Both of these programs offer opportunities for interventions through vocational and agribusiness courses.

The team concentrated its review on questions of curriculum, especially courses that would prepare students for work in agribusiness or that might stimulate entrepreneurship. Many of our contacts within education confirmed in interviews that business, management, vo-ag and related entrepreneurial studies was a programmatic weakness. There simply are not expert teachers with practical experience in these areas. At the mid-level institutes some faculty seemed to believe that they were teaching business skills; however, the content descriptions were little more than rudimentary cost calculations with little strategy included.

Future Program in Agricultural Higher Education

Under the Ministry of Higher Education, Science and Technology (MSCAT) a completely new system of polytechnical education similar to the South African Technikon is being proposed. A three-year course of study beyond the secondary level, thus Educação Superior, is projected to begin in 2005 with (eventually) 3000 students per institution. The program will answer the need for practical curriculum that will respond to the business community, encourage self-employment, and act as an incubator for new businesses. Students will enter after completing grade 12. Because these schools are to be located outside of Maputo they will both serve the provincial student population and the surrounding business community as a resource.

The rationale and current status of the proposed polytechnic institutions under MSCAT were described by Minister Lydia Brito and also presented in a day-long seminar to stakeholders. There are to be three Polytechnics: Instituto Superior de Geologia e Minas to be located in Tete and two agricultural institutes, Institutos Superiores de Ciencias Agrarias in Manica Province and Gaza.

Characteristics of the Approach:

- Modeled on the South African technikons;
- Located in existing facilities in Manica and Tete (need to construct buildings in Gaza);
- An unresolved need is for teachers skilled in the problem-solving approach of the technical school; and
- Curriculum under discussion has not been settled.

Because the progress and needs of these institutions are still unknown it is not practical to recommend assistance at this time. However, if successful, the agricultural polytechnic would answer many unmet needs. Support to the polytechnic should be reviewed once again as planning progresses.

The demand for higher education programs is best illustrated through examples of the private institutions that are opening to serve both urban and rural populations. The team visited private universities in Mozambique, notably the Higher Institute of Science and Technology (ISTEM) in Maputo. Though this facility does not offer agriculture the well planned and organized operations demonstrate the great demand for advanced education. Additionally, institutions such

as ISTEM and possibly others that we did not have time to visit may offer possibilities for partnering in the implementation of programs.

“WE NEED TOP CLASS FARMERS AND TOP CLASS SCIENTISTS.”

DR. JOAO CARRILHO, VICE MINISTER, MADER

PART III: RESPONSES TO ASSESSMENT

A Program for Capacity Building in Mozambique

Vice-Minister Carrilho’s succinct expression of agriculture sector needs in Mozambique lacks one phrase for it to be a complete needs synthesis. The assessment team would simply add “supported by a thriving agribusiness sector”. Those three components — the farmer producing at a commercial level; research focused on Mozambican crop, soil and animal needs; and a strengthened agribusiness segment — will be the focus areas for interventions in this report.

A. CAPACITY DEVELOPMENT PROGRAM COMPONENTS

Terminology Defined

The following terms are defined as they are used in this report:

Capacity Development (also Human Capacity Development): refers broadly to the comprehensive program of education, skills training, professional development activities, conferences and other systemic approaches used to improve or enhance the performance of personnel within an institution or sector.

Capacity Building: the application of education and training interventions to enhance knowledge and skills, i.e., the human capacity of an individual or institution. Capacity development and capacity building replace *training*, still commonly used as a generic term to discuss diverse learning activities.

Short-term training: approach to capacity building that is built on focused objectives that can be accomplished in a defined period of time. Such programs can be a few days in length or four to eight weeks or even longer. They may be technical or academic in nature. Short-term training includes skills-based programs exemplified by instruction in how to use tools or software as well as seminars, workshops and short courses. In this report all recommendations for *short-term* or *technical* training form part of the comprehensive capacity development recommendations.

Long-term training: as used in USAID programs, training of greater than nine months usually but not always in a degree-seeking program;

Academic training: used in this report to denote training that conforms to the more rigorous requirements of university education. It implies the quality and demands of higher level professional education. It may or may not lead to a degree; it may also be of short duration as in intensive summer institutes or workshops that include academic requirements.

Institutional strengthening: refers to the combined interventions designed to improve the effectiveness of an institution. Interventions focus on multiple aspects of operations: personnel

development, training, review of policies and processes such as accounting, program monitoring and reporting.

Priority Target Groups

The following major target groups where training can produce greatest measurable results:

- Extension workers as the direct link to the smallholder;
- The research division of MADER, INIA;
- Actual or potential agribusiness faculty in technical schools or universities;
- Agricultural students through agribusiness, vo-ag, and entrepreneurship courses; and
- Workforce in general to enhance participation in agribusiness.

Priority Capacity Development Objectives

Based on the constraints to growth in the agricultural public and private sectors, the following development objectives emerge as priorities. These objectives lend themselves to capacity building solutions:

- Improve the knowledge and skills of extension agents in target areas;
- Increase number and breadth of ‘directed’ research activities immediately applicable to the Mozambican agricultural needs;
- Strengthen the capacity and credibility of researchers in INIA;
- Strengthen agricultural and especially agribusiness education at the secondary and university level; and
- Contribute to private sector growth through business and vocational training skills.

Recommended Capacity Building Formats

In-Country or Regional Training

A larger proportion of training for the two most important target groups, extension agents and INIA scientists, should be in Mozambique or in the region. Placing most of the initial programs in the region would provide a pragmatic answer to two concerns: first that many international graduate programs focus on research topics that are not priorities and in some cases not relevant to Mozambique crops, diseases or other issues. Additionally, regional and by implication shorter term coursework mitigates the problems caused by key personnel being away from the organization for long periods of time.

The following capacity development interventions are suggested as useful elements of a comprehensive capacity development program. Several are developed further under the specific recommendations for programs to address specific objectives. Training formats include:

- Workshop Series: best designed as progressive and intensive events that build knowledge and skills in related content areas;
- Certificate Programs: related short courses required to gain competence in an area;

- Collaboration with outside expert agricultural organization, e.g., EMBRAPA;
- Academic coursework provided by regional institutions: these could be part of an institution's basic curriculum or courses tailored to specific needs;
- Academic courses designed and implemented in Mozambique by U.S. agricultural universities. Examples are the summer institutes described on page 21;
- Graduate level degree programs taught in conjunction with Mozambican institutions as the Twinning Model described later in this section.

International Scholarships for Degree Training

Given the need for quality research, teaching, and knowledge of current extension techniques, graduate-level training should not be ignored. While U.S. agricultural universities have superior programs in all agriculture and extension fields, international programs in Brazil afford the advantage of a common language and climate similarities. The two Central American programs address the particular need for practical experience within their program design. Details of specific programs are discussed in Appendix D.

Illustrative Examples of Promising Sites:

- University of Natal – other South African Agriculture schools
- Escola Superior de Agriculture “Luis de Queiroz”)ESALQ, Brazil
- Universidade Federal Rural do Rio de Janeiro (UFRRJ)
- Universidade Federal de Santa Maria (UFSM), Brazil
- EARTH University, Costa Rica
- Zamorano University, Honduras

The recommendations below describe various training approaches to capacity development for each of the objectives. The beneficiaries of training and the venue are also discussed and can be as important as the content in ensuring that desired results are achieved.

B. CAPACITY BUILDING RECOMMENDATIONS

Objective: *To increase technical knowledge skills of extension agents in target areas*

A basic program for the extension agents should include mastery of a range of communication skills adaptable to the least sophisticated as well as to more experienced segments of the rural community beneficiaries. Of course technical agricultural topics and methodologies would be part of a skills upgrade program. Beneficiaries of training can also be those extension workers

employed by the NGOs as part of the Ministry's outsourcing or their own employees who play an information and training role. Both short-term and academic courses would be useful here.

- **In-Country Workshops**

Variations on the technical workshops should be explored to upgrade the skills and thus the quality of the extension service. First is a series of in-country workshops designed to provide skills in vocational and technical areas. Additionally, knowledge and skill in specific subject matter, e.g., use of fertilizers, irrigation techniques and animal vaccination can be presented effectively through workshops and workshop series. According to the descriptions found in the Bias and Donovan report, technical training for technicians appears to be offered at the provincial level by subject matter specialists as a kind of in-service training. We do not know how limits on time and demands on personnel affect this strategy; however, in order to avoid duplicating effort course design should be coordinated closely with provincial supervisors. .

Training Delivery: An outside expert group like EMBRAPA or an agricultural NGO or academic institution working under contract would be the logical implementer for this type of ongoing workshop. Partnering with a known Mozambican institution or agency which would offer the venue and some organizational structure for such courses would facilitate the implementation. A local counterpart, e.g. an NGO, or IAC in Chimoio or Catholic University in Beira, could prove to be instrumental in recruiting and processing participants.

- **Technical Coursework in the Region**

Similar coursework could be tailor-made by a known and respected agricultural institution in the region. There are several advantages to sending participants out of the country for such a course. The coursework itself would be in an academic setting and could be designed to be an intensive semester. The University of Natal is a venue to consider as well as other RSA institutions. Europe and Brazil are regions to explore as well as specially designed courses in the U.S. or Costa Rica.

- **International Scholarship (or non-degree coursework) for selected extension agents**

To evaluate this recommendation, a closer analysis of the operational units providing extension services needs to be done. Numerous institutions offer strong programs in extension work including the U.S., Costa Rica and South Africa. The course offered at EARTH in Costa Rica that is based on a combination academic and practical approach that is needed in Mozambique offers a Licentiate in Agronomy after a four year program. The Licentiate is between the BS and MS. There is no advance placement option so the most likely candidates would be those finishing secondary technical school. The time away from country and the need to obligate the trainee to return and spend time contributing to the country would have to be weighed carefully. The costs, however, compare favorably with the more expensive US. courses, less than \$14,000 per year for tuition, room and board and books.

Objective: ***To improve quality and relevance of research conducted by the Mozambican Institute for Agricultural Research (IIAM) through academic-level coursework***

The ability to produce high-level, reliable research that can be translated into strategies and approaches for the farmer is hampered by the limited number of qualified scientists working within the institution. The educational breakdown of the scientists and technicians in INIA presents compelling evidence of the need for strengthening. As described earlier in this report, in the agency of approximately 1,100 employees only about 10% have degrees and less than 4% have a Master of Science or PhD⁶. The scant number of trained scientists, the preponderance of scientists and technicians located in Maputo and the need for research on topics specifically relevant to Mozambique together make a compelling case for capacity building assistance.

The recommendations for training IIAM (INIA) personnel are predicated on the assumption that the reorganization into Zonal Research Stations will take place and that adequate personnel will staff the Stations. Training content for researchers then will be driven by the agro-ecological issues of each zone.

- **Tailor-made Academic Coursework**

To address the problem repeated by many within MADER the scientists and researchers who conduct the research programs and run the stations are ill equipped to address the specific issues that face farmers in Mozambique. Thus *Directed Research* was recommended as a way to target current problems.

Topics like animal breeding and reproduction, feeding systems for livestock, diagnosis of tick-borne diseases, swine fever, gastro-intestinal parasites of ruminants, quality control of food for animals, forestry topics, agronomy topics, research design and methodology, biology, lab management, post harvest techniques, and soils were all listed as areas of intensive, focused short-term research that could have positive near-term applications. Thus, a ten week up to a semester-long program could be designed to provide relevant training for many scientists and technicians rather than the few who might be eligible for graduate programs.

- **Regional International Scholarships**

Such scholarships would by definition be degree-seeking. The gradual increase within INIA in the number of scientists and technicians with degrees will gradually improve the performance of the institution as a whole including the ability of the researchers to design and conduct demonstrations and experiments on crops and inputs relevant to the Mozambican reality. As long-term scholarships have the negative effect of reducing the number of experienced personnel within the institution, care must be taken to avoid damaging INIA's ability to function especially as they are reorganizing into the Zonal Centers.

- **Regional Intensive Tailor-Made Courses Designed to Meet Research Data Needs**

Though research lends itself more than any other field to a traditional academic response, we nevertheless recommend that USAID concentrate initially on in-country or regional programs,

⁶ Bias and Donovan, page 79.

albeit at a higher academic level. The need for research that is closely tied to the Mozambican agricultural reality and the need to see near-term results from the research argue for intensive, shorter duration activities. An example presented to us that could be a short-duration, intensive course was “detecting gastro intestinal parasites in ruminants.” Additionally, the team is well aware that removing a large group of upper-level professionals from the roster of INIA employees for training abroad must damage the ability of the group to proceed with the planned reorganization or at least cause stagnation.

Intensive short-duration courses in “Research Topics” could be designed and presented by various regional and Mozambican university departments. The University of Natal is a likely venue for specially designed courses on agricultural topics. EMBRAPA could be contracted to present certificate courses in Mozambique. Tanzania also offers a possible venue which should be explored further.

The short-term courses discussed above are recommended for staff who need to refresh or to upgrade their approach to research and investigation as well as to provide current research findings on issues of immediate concern.

- **Academic Institutes Designed in Modules for Scientists and Educators**

This concept is appropriate for educators who cannot take a long period of time for an advanced degree. Such courses should be designed and offered by a university with a reputation for expertise in agricultural education techniques or research as well as climate and conditions that mimic those of Mozambique. The Academic Institute would offer core courses designed and taught at a graduate level. This is a format used by many U.S. universities to provide intensive coursework to working professionals or graduate students.

Multiple intensive two- or three- week courses can be offered successively and therefore provide a progression toward advanced work (or toward an accumulation of credits) in a single nine- or ten-week period. Requirements can be designed into the series of two to three modules leading to a certificate of completion offered by a university. An example might be that of a program of six or eight courses leading to a Certificate of Accomplishment in Research Design or Teaching Methods in Agribusiness. Alternatively, the institution could offer credits which can be accumulated over time. It is important that such courses, though short in duration, be offered on a regular, recurring basis such that they are predictable and convenient to the Mozambican timetable. Ideally, they would be associated with a university or institution that has a regional or worldwide reputation. This again ensures the value and recognition of the courses.

Objective: *To strengthen agriculture faculty in technical and university institutions*

We were unable to find agribusiness and entrepreneurship strengths in the agricultural education programs, nor was a published curriculum description or list of courses available to the team. Nevertheless, there is strong indication of the need to consider faculty development or curriculum development as an intervention both at IAC and the UEM Masters program. We recommend that this option be investigated further. Teaching faculty would be appropriate participants in the Academic Institute. Because of the potential for reaching a broader audience through the classroom, a carefully-crafted intervention directed at the educator could result in

improvement in agricultural education and have a broad spread effect. Skills upgrade through the academic institutes makes sense here.

- **Graduate Level Degree Courses – The International Twinning (Sandwich) Program, Master of Science Level**

One model of the joint program often called the ‘sandwich’ or twinning program could be easily developed in collaboration with Eduardo Mondlane University. A recently completed curriculum evaluation has resulted in a new two-year graduate program which offers a Master of Science degree. It has several tracks: Natural Resource Management, Economic Policy Analysis, Agribusiness, and Rural Extension. Arrangements between a designated advisor at UEM and a partner (U.S.) institution could ensure that most of the coursework is completed at UEM but that visits to the international partner institution would provide experience, research and additional short-duration course work abroad.

The program design discussed with professors of UEM posited an ideal sandwich model in which the student would begin a program of studies in Maputo but have an agreement with a U.S. university to collaborate on the program. The U.S. professor assigned to the program would visit Maputo from time to time, provide advice and review the student’s progress with counterpart instructors from UEM. In some cases credits, perhaps a semester, would be taken at the U.S. campus. In all cases the research component of the program would take place in Mozambique. Agreements between the two institutions, UEM and the U.S. university program, would include several points:

- a subscription or access to the Internet library so that the student can continue research from Mozambique;
- credits recognized by both institutions;
- satisfactory student performance meeting the academic standards of both partnering institutions; and
- availability of advisor at both institutions.

Students could be recruited to this program from those already accepted into the UEM Masters program; some second-year UEM students could apply; or new students desiring to enter one of the four tracks could be recruited. The numbers of students will be limited by the staff available to act as advisor and counterpart to the U.S. professor. We recommend exploring scholarship options for ten students. Current fees are very modest, approximately \$4,000 for the two-year program. No doubt these costs would increase with the addition of an international partner, subscriptions to periodicals and Internet research libraries, travel, and other fees.

Distance learning technologies, blended instruction and video conferencing would all lend themselves to the implementation of twinning programs. In fact some inexpensive conferencing techniques would provide beneficial ongoing communications between the partnering institutions. The cautionary note in this regard is not to lose sight of the importance of the practical application of agricultural knowledge and skills.

The number of sandwich programs could increase if Catholic University together with its agriculture school in Cuamba were able to participate. Several considerations recommend deferring this option. First, the new agriculture program is still unproven and suffering from

logistical growing pains. However, the location in Cuamba, the student population (exclusively rural) and the past history of Catholic University suggest this as a possibility for a later addition to the USAID program.

- **International scholarships**

ZAMARANO – Tropical Agriculture Joint Program

Interestingly, ZAMARANO, located in Honduras, has a Masters program in Tropical Agriculture offered jointly with Cornell. The program offers both theory and the practical component missing from most of the Mozambican programs. Courses are taken at Cornell initially, then followed by coursework and practical work at the campus in Honduras. See Appendix E.4 for a program description. The cost for a two-year program is \$30,000 for tuition and accommodations. This program presents a dual language obstacle in that participants must be fluent in Spanish and English. However, the curriculum and requirements serve as a model for what agricultural curriculum at the university level is striving for in Mozambique.

EARTH -- Licentiate in Agronomy

This is a four-year program that combines theory and practice. It incorporates agriculture topics, sustainable farm management, natural resources and social awareness. Emphasis is placed on critical thinking and practical skills. The licentiate is between the B.S. and the M.S. The program is also described in E.3.

Objective: *To facilitate communication between INIA and extension through joint training sessions*

Communicating the results of research and investigation to the smallholder requires formal linkages between the two services. Though the need to transfer information and research results between the scientists of INIA and extension workers in MADER as well as between NGO researchers and MADER must be addressed at an institutional level, there are some informal ways to approach this issue of communication. Many programs meet the academic and skills needs of both extension and research. When appropriate, we recommend placing representatives from both groups in the same training. Semester-long training sessions such as might be developed at University of Natal would provide time for professional friendships and associations to form. If scholarships are provided to a program like EARTH, which has both a practical research component and a community development component, members of both divisions could attend the same course.

Objective: *To improve workforce skills in the agribusiness sector through workshops*

There is little doubt that the lack of a capable pool of workers places severe limitations on business growth. Literacy and numeracy are known to be at extremely low levels in the rural agricultural communities. The pervasive lack of basic business skills, difficulty finding trustworthy employees, the need for accountancy, and workers missing life skills was repeated at most interviews. Nevertheless, this is the more difficult segment of the training plan to elucidate in specific terms, not because of content, but because of the diffusion of the target group throughout the population. In order to bring this element into manageable proportions we

recommend targeting clusters of trainees or potential trainees in the communities through specific local institutions.

There are several entry areas in the communities where access to a target group is possible and where follow-up and monitoring can also take place. One of these might be the entry-level employees who need the most basic business skills. Thus, they would be in transition between completing their formal schooling and beginning work, or they could be new employees sponsored by their employers. These employees might be identified through CLUSA or another NGO already working in rural area. Another national target group would be the students in their final year of technical education, e.g., at the Agricultural Institute of Choimoio (IAC). Workshops in addition to their regular curriculum would need the support of the Ministry.

- **Training Design**

The overall poor performance of workers at all levels is due not merely to a need for better or additional knowledge but a great need for practical experience and role modeling. The best approach to address the lack of specific workplace skills is through progressively more advanced short-term training workshops and internships. The detailed training aimed at meeting specific objectives can be designed and managed through an intermediary such as a contractor, and implemented through a local partner, e.g., a school or an in-country NGO with comparable mission. We recommend avoiding opportunistic, ‘single shot’ programs that are not part of a larger employee development plan. The program that is ultimately developed should be coherent, clearly designed to meet objectives, and finally, have a monitoring and a follow-on component.

Workshop Strategy

Step One: Design series of courses in skill deficiency areas

Step Two: Pilot test for content and level of instruction

Step Three: Design the Train-the Trainer Course and teach a core team of teacher/trainers to repeat the material

Step Four: Provide follow-up

It is desirable to aim for a critical mass of trainees who, though dispersed throughout the workforce, are identifiable as having been part of a program. This aim builds upon the idea of creating ‘a mystique’ or a circle of trained persons who can boast of having gone through a structured training course including a practicum that has a reputation for high quality. This mystique can be associated with the known reputation of the training provider (e.g., EMBRAPA or GAPI, an international NGO, or an institution of higher education recognized for excellence). A certificate of accomplishment as a recognition of successful completion of the series adds to the credibility of the Workforce Skills Series. See Appendix F for suggested workshop series.

- **Internships: The Entrepreneurs International Model**

Internships provide the specific workplace know-how and should be included in the Workforce Skills Series to the extent possible. They are currently recognized and used to advantage by the technical schools. Interviewees who had worked with interns from the agriculture schools were able to comment knowledgeably about their preparation and work habits. Advanced tier agribusiness professionals and entrepreneurs could also benefit from regional, third-country or U.S. practica. The Entrepreneurs International (EI) model has been an effective mechanism for placing participants in a hands-on work environment. USAID/Tanzania used EI to place small business owners and entrepreneurs in U.S. counterpart businesses in a wide variety of commercial areas. It seems reasonable that India, South Africa or Brazil as well as the U.S. would also offer opportunities for such placements. Though somewhat labor intensive to plan and monitor, the EI program costs are usually limited to honoraria, transportation and per diem expenses.

C. LINKAGE BETWEEN RECOMMENDATIONS AND USAID STRATEGY

Improved performance among farmer groups, extension agents, research and agricultural education institutions have a direct link to Strategic Objective 6 goals for the current USAID strategy. The increasing development of agricultural production is the foundation of economic growth in Mozambique. The USAID SO 6 team aims to achieve rural poverty reduction through a dual emphasis within the agricultural sector: through private sector market development and by helping to strengthen public sector institutions that support agricultural growth. The recommendations for training interventions in this report support both public and private sector agricultural initiatives.

USAID's Intermediate Result #1 (IR1), *Increased smallholder sales of agricultural production*, seeks to move farmers from subsistence to a market orientation. Recommended workshops and longer programs on vo-ag and business skills for farmer associations and extension agents directly promote marketing, improved production techniques and business performance among the rural population. Regional training and academic coursework address agricultural support services in a holistic manner by strengthening research-extension-farmer linkages, and transferring farm technology through farmers' associations.

IR2, *Rural enterprises expanded*, recognizes that mere increased agricultural productivity is not the key to increased income: only an adequate understanding of marketing policies and procedures can translate increased productivity into profit and increased income. Nascent farmers' associations will benefit from short courses in "Basic Business Skills and Basic Business Management Skills", while new or potential entrepreneurs are the focus of the suggested training program "Establishing a Successful Business." The workshop on "Rural Credit Programs" will teach business leaders not only the mechanisms of loans to small rural businesses but also how lenders analyze loans and how to successfully apply for credit.

PART IV. EXISTING PROGRAMS

A. OPPORTUNITIES FOR COLLABORATION/ DEEPENING IMPACT

MADER Programa de Formacao de Recursos Humanos supported by FAO

An extensive assessment of capacity development needs within the Ministry was completed in November, 2002 under PROAGRI. The study includes vital information regarding the distribution of human resources throughout MADER, their functional assignments, levels of education for staff as well as recommendations for ongoing professional development. FAO is supporting the program through a consultancy aimed at developing a specific training plan for the management of MADER. This consultancy is in process.

Based on interviews with MADER directors and the FAO consultant, Sergio Remagen, as well as documents developed under the assessment study, it appears that initial training efforts will be directed at the upper management levels of the Ministry, i.e., directors and chiefs of departments. This current activity offers USAID a timely opportunity to participate in and support capacity development for the management level of MADER. Many questions remain regarding the design and venue of the individual programs, participant selection, and follow-on activities to promote transfer of training. However, since the design of the intervention will be completed by the training specialist consultant it appears to be a cost efficient mechanism for strengthening MADER.

CRSP Graduate Education Program

In August of 2001 ten students from INIA began graduate level work at various U.S. universities. See Appendix G for a list of students, degree objective and placement. The students are sponsored under an existing cooperative program directed toward Masters and PhD programs. At completion of the programs the returning Mozambican scientists will strengthen INIA's capacity; however, the conditions of their reintegration into the organization are undefined. It would be useful to prepare for the return by reviewing the student scholarship agreements to see when they are returning and what arrangements need to be made to maximize their utility to INIA and the country. By 2004 INIA should have begun the reorganization into the zonal research stations which may well need researchers and scientists. However, the reintegration of returning students must be carefully thought through such that both the institution and the student benefit.

Memorandum of Understanding (MOU) between Mozambique and Brazil

Parties to the agreement are the Government of Mozambique, Agencia Brasileira de Cooperacao (ABC) and Empresa Brasileira de Pesquisa Agropecuaria (EMBRAPA).

The MOU describes assistance offered to Mozambique from the Government of Brazil to be realized over an 18-month period between July 2003 and December 2004. Brazil, through EMBRAPA, offers consultancies and training in a variety of topics to the INIA successor research institution, Instituto de Investigacao Agraria de Mocambique (IIAM.) Projected funding of \$613,810 is to be shared almost equally between the ROM and Brazil. The description of the activities and technical assistance offered to IIAM mirrors many of the

recommendations in this report. However, the team did not hear of current training activities while we were carrying out our assessment. This leads us to question whether the program has been delayed. USAID supported programs directed at INIA (IIAM) should be coordinated with the EMBRAPA consultants and the director of INIA to prevent duplication of effort. INIA appears to be the beneficiary of several program interventions. We recommend that USAID review the training activities proposed for INIA to be sure that the activities are likely to achieve intended results. This means that the right topics, right amount of training and right number of participants are targeted. It is also possible that the activities under this MOU might be augmented by USAID thus covering a larger target group. Another alternative is for EMBRAPA to focus on designated regions while similar USAID programs continue to take place in the USAID targeted regions.

Donor coordination under PROAGRI

Note: This section is based on a review of the Donor Coordination Assessment (Frantz and Komich), January, 2003 as well as current material from major donor websites.

Mozambique's rising economic growth and successful inflation reduction, combined with overwhelming poverty and need, have attracted prodigious amounts of international donor agency grants and loans. Foreign assistance, in fact, accounts for a minimum of between 55% and 60% of the government budget, according to the Ministry of Planning and Finance (these figures reflect only assistance known to and acknowledged by the Government; actual amounts would be higher). Major donors to the GRM include USAID, the IMF and World Bank, and the G10 (nine European nations plus the EC).

According to a 2002 study by António da Silva Francisco, there were at least 46 bilateral and multilateral agencies in Mozambique in 1999, plus an estimated 150 or more NGOs. In addition to international or multinational organizations, many significant donor programs are sponsored by European countries, such as Denmark, Ireland, the Netherlands, Norway and Sweden. With so much assistance available, strong donor coordination is essential to ensure the efficiency of resource management, avoid overlap and redundancy, and limit the burden placed by donors on a Mozambican government that often lacks sufficient capacity to adequately manage diverse donor programs and reporting demands.

GRM Agricultural Plan – PROAGRI

The Government of the Republic of Mozambique (GRM) instituted the National Program for Agricultural Development (PROAGRI), a program to reform, decentralize and modernize the agricultural sector, implement mechanisms to ensure sustainable use of natural resources and strengthen Mozambique's capacity to provide agriculture public services. The ten largest donors including USAID, the EC and World Bank along with several others have pooled resources in support of PROAGRI which has served to rationalize the contributions of most donor agencies to the agriculture sector. Phase II, the second five year program, of PROAGRI will focus more on field level interventions.

According to Franz and Komich, PROAGRI is a true partnership between the GRM and the donors. This has had the effect of making most donor-supported activities in the country known to the Ministry of Agriculture and Rural Development (MADER), which in turn has enhanced

MADER's ability to fulfill its planning function. Nearly all major donors operate within the PROAGRI framework.

B. DESIGN A COMPREHENSIVE PLAN

Of the recommendations presented in Part III and the various approaches appropriate to achieving improved performance among each of the target groups, many combinations of short-term, regional, academic summer programs and degree granting programs can be selected to form a comprehensive training plan covering the strategy period of the next seven years. Several considerations will guide the development of a capacity building plan that will strengthen the public sector and promote market development. The USAID SO 6 team must decide on which components are to be emphasized, budget allocation constraints, and the implementation method. The following decision steps can guide the program design:

- Choose the target groups most likely to show performance improvements in USAID's priority areas;
- Focus on the desired training objective;
- Choose the activities that will most quickly and efficiently contribute to results;
- Consider the existing or outside conduit available to present the training, i.e., that can best reach the target group, e.g. associations, agricultural programs like IAC and others, regional institutions, workshops designed by outside experts; degrees, professional development seminars;
- Identify the number of candidates to be trained in a given year;
- Identify the budget allocation available;
- Choose an implementation vehicle.

One scenario that follows the above steps would be to determine that the highest priority is to focus on supporting research and extension as having a direct link to farm production. The training objective chosen would be to improve the capacity of technicians to carry out research design as well as to produce relevant current research on topics immediately applicable to the Mozambican context. Extension agents must be included as the obvious connection to the rural farmer. Several activities could be used. Among the choices, we would include the 'directed' research described by INIA representatives. This could be research carried out under the guidance of agronomists in Mozambique, through semester-long courses in a regional university (to be identified), and combined with additional long-term scholarships offered to extension agents or INIA technicians. Another activity choice that could be combined to achieve the objective is to engage a outside expert group (e.g., EMBRAPA) to provide short term skills training on specific topics such as lab management or agricultural topics.

Similar scenarios could be constructed with each objective. Improving agribusiness education in Mozambique could lead to quite different combinations of activities. Designing courses and negotiating the necessary curriculum changes in institutions like IAC and Boane combined with placing an agribusiness teacher in the schools is one approach working through existing institutions. Designing workshop courses to be presented through associations or set up by outside expert trainers would be another.

Critical Mass. Results are also affected dramatically by the numbers to be trained in a given area, the critical mass. The likelihood of creating change in performance increases with the numbers of persons trained. Thus, greater benefits accrue to training more persons in fewer

priority areas than in trying to cover all the identified needs. One way to achieve critical mass without decimating the institutions is to use shorter term training delivery methods and in-country venue in greater proportion to long-term scholarships. Staggering the start dates of programs such that clusters of participants can be away at different times can also allow focus on a particular institution without impeding the work of the institution.

Reinsertion. Along with the new participants to be selected and offered training the CRSP students also should be considered as part of the strategy to advance rural agricultural incomes. Students returning from academic programs abroad would benefit from some attention and assistance in the process of reinsertion into their agencies. If a training agreement was signed those returning scientists will remain and hopefully continue to make a contribution to the scope and quality of ongoing research. Any new program design should have a follow-on component that among other things provides intellectual and support and encouragement to returning scholarship students. Those same students are a potential resource to provide orientation to new training programs also.

The following chart provides a template to illustrate some of the training plan choices that might evolve from the findings in this agriculture assessment.

C. ILLUSTRATIVE DESIGN OPTIONS

Training Type/ Degree Objective	Beneficiary	Provider	Venue	Students per Year
Management skills (existing course)	MADER	Coord w HR consultant	In-country	
Twinning: UEM and US institution	INIA	UEM Masters program with US	Maputo and TBD	
Licentiate in Ag Sciences	Extension & INIA	EARTH	Costa Rica, 4 year prog	
Short Courses in agribusiness – specially designed	Faculty & students from UEM, ICA, associations	EMBRAPA, other	In-country	
Short Courses on technical ag topics	INIA & Extension	University of Natal	Regional	
Academic Institutes individual modules	INIA & Extension	TBD/US institutiions	In-country	
Workforce business skills	IAC students, associations, other	TBD	In-country	

Proportion of In-country training to international training should be roughly 80% in the region including in-country with approximately 20% international venues. Additionally course charts reflecting alternate scenarios appear in Appendix H.

D. MECHANISM TO IMPLEMENT A CAPACITY DEVELOPMENT PLAN

An efficient way to implement a multi-faceted capacity development program -- one with university placements, short-term in-country activities, regional placements and tailor made workshops and courses -- is to use a vehicle that provides the flexibility to handle all these modalities and also provides the ability to subcontract with appropriate institutions. While many options are open to USAID including the cooperative agreement, an existing contract like the

MOBIS or START or a completely new contract, Mission will benefit from using an institution that can design, implement, monitor benchmarks and track the USAID training requirements.

Centralizing management and implementation through a single agreement or contract provides USAID with clearly defined communication channels and a single coordinator responsible for all types of capacity development activity. Given the likelihood of large numbers of activities and beneficiaries per year, an in-country office and basic staff would be called for. USAID training and reporting requirements include as a minimum developing a monitoring plan, using recruitment guidelines that encourage gender equity, designing and implementing follow-on activities, tracking participant numbers through the mandated TraiNet system, and finally, familiarity with the new SEVIS visa procedures.